CLAIMS

1   1.   A system for providing error correction in an imaging system, said system comprising:

2   error determination means for determining an amount of error associated with a spot at

3   (x,y) in a binary pattern to be imaged;

4   determination means for determining the location of a nearest exposed spot at (x_i, y_i) for

5   each spot (x,y); and

6   dose modification means for modifying an exposure dose at the nearest exposed spot $(x_i,$

7    $y_i)$ for each spot (x,y).

1   2.   The system as claimed in claim 1, wherein said error determination means includes

2   determining a convolution of the binary pattern to be imaged with a point-spread function.

1   3.   The system as claimed in claim 1, wherein said error determination means includes

2   determining an inverse fast-Fourier transform of a product of a fast-Fourier transform of the

3   binary pattern and a fast-Fourier transform of a point spread function.

1   4.   The system as claimed in claim 1, wherein said error determination means includes

2   determining a thresholding pattern as a function of the exposed pattern.

1   5.   The system as claimed in claim 1, wherein the amount of error associated with the spot

2   (x,y) in the binary pattern to be imaged is provided as a difference between a thresholding pattern

3   and the binary pattern.

1   6.   The system as claimed in claim 1, wherein said system includes repetition means for

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2   iteratively determining the amount of error associated with a spot at (x,y) in the binary pattern to

3   be imaged until the amount of error is not greater than an acceptable amount of error.

1   7.   A system for providing error correction in a lithographic imaging system, said system

2   comprising:

3   exposed pattern simulation means for simulating an exposed pattern of a binary pattern to

4   be imaged;

5   thresholding means for determining a thresholding pattern by applying a thresholding

6   function to the exposed pattern;

7   error determination means for determining an amount of error associated with a spot at

8   (x,y) in a binary pattern to be imaged corresponding to a difference between the thresholding

9   pattern and the binary pattern;

10   determination means for determining the location of a nearest exposed spot (x_i, y_i) for

11   each spot (x,y); and

12   dose modification means for modifying an exposure dose at the nearest exposed spot at

13   (x_i, y_i) for each spot at (x,y).

1   8.   The system as claimed in claim 7, wherein said exposed pattern simulation means

2   includes determining a convolution of the binary pattern to be imaged with a point spread

3   function.

1   9.   The system as claimed in claim 7, wherein said exposed pattern simulation means

2   includes determining an inverse fast-Fourier transform of a product of a fast-Fourier transform of

3   the binary pattern and a fast-Fourier transform of a point spread function.

1   10.   The system as claimed in claim 7, wherein said system includes repetition means for

2   iteratively determining the amount of error associated with a spot at (x,y) in the binary pattern to

3   be imaged until the amount of error is not greater than an acceptable amount of error.

1   11.   A method of providing error correction in an imaging system, said method comprising the

2.   steps of:

3   determining an amount of error associated with a spot at (x,y) in a binary pattern to be

4   imaged;

5   determining the location of a nearest exposed spot at (x_i, y_i) for each spot at (x,y); and

6   modifying an exposure dose at the nearest exposed spot at (x_i, y_i) for each spot at (x,y).

1   12.   The method as claimed in claim 11, wherein said step of determining an amount of error

2   associated with a spot at (x,y) in a binary pattern to be imaged includes determining a

3   convolution of the binary pattern to be imaged with a point spread function.

1   13.   The method as claimed in claim 11, wherein said step of determining an amount of error

2   associated with a spot (x,y) in a binary pattern to be imaged includes determining an inverse

3   Fourier transform of a product of a Fourier transform of the binary pattern and a Fourier

4   transform of a point spread function.

1   14.   The method as claimed in claim 11, wherein said step of determining an amount of error

2   associated with a spot at (x,y) in a binary pattern to be imaged includes determining a

3   thresholding pattern as a function of the exposed pattern.

1   15.   The method as claimed in claim 11, wherein the amount of error associated with the spot

2   (x,y) in the binary pattern to be imaged is provided as a difference between a thresholding pattern

3   and the binary pattern.

1   16.   The method as claimed in claim 11, wherein said method further includes the step of

2   iteratively returning to the step of determining the amount of error associated with a spot at (x,y)

3   in the binary pattern to be imaged until the amount of error is not greater than an acceptable

4   amount of error.

1   17.   A method of providing error correction in a lithographic imaging system, said method

2   comprising the steps of:

3   simulating an exposed pattern of a binary pattern to be imaged;

4   determining a thresholding pattern by applying a thresholding function to the exposed

5   pattern;

6   determining an amount of error associated with a spot at (x,y) in a binary pattern to be

7   imaged corresponding to a difference between the thresholding pattern and the binary pattern;

8   determining the location of a nearest exposed spot at (x_i, y_i) for each spot at (x,y); and

9   modifying an exposure dose at the nearest exposed spot at (x_i, y_i) for each spot at (x,y).

1   18.   The method as claimed in claim 17, wherein said step of simulating the exposed pattern

2   of the binary pattern to be imaged includes determining a convolution of the binary pattern to be

3   imaged with a point spread function.

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1   19.   The method as claimed in claim 17, wherein said step of simulating the exposed pattern

2   of the binary pattern to be imaged includes determining an inverse Fourier transform of a product

3   of a Fourier transform of the binary pattern and a Fourier transform of a point spread function.

1   20.   The method as claimed in claim 17, wherein said method further includes the step of

2   iteratively returning to the steps of determining a thresholding pattern by applying a thresholding

3   function to the exposed pattern and determining the amount of error associated with a spot at

4   (x,y) in the binary pattern to be imaged until the amount of error is not greater than an acceptable

5   amount of error.